

REMARKS / ARGUMENTS

The present Amendment is in response to the Office Action mailed January 9, 2006. Claims 24, 35-41, 46, and 53 are amended. Claims 24-53 are now pending in view of the above amendments.

Please note that the following remarks are not intended to be an exhaustive enumeration of the distinctions between any cited references and the claimed invention. Rather, the distinctions identified and discussed below are presented solely by way of example to illustrate some of the differences between the claimed invention and the cited references. Reconsideration of the application is respectfully requested in view of the above amendments to the claims and the following remarks. For the Examiner's convenience and reference, Applicant's remarks are presented in the order in which the corresponding issues were raised in the Office Action.

Claim Rejections Under 35 U.S.C. § 103

The Office Action rejected claims 24-27 and 53 under 35 U.S.C. § 103(a) as being unpatentable over *Watanabe* (U.S. Patent No. 6,681,303) in view of *Ohran* (U.S. Patent No. 5,835,953). Claims 28-52 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Watanabe* and *Ohran* in view of *Armangau* (U.S. Patent No. 6,434,681). The following discussion illustrates that the pending claims are patentable over the cited art.

The ability to access accurate data is a vital part of many business operations. As a result, there is a need to reliably backup data. Often, there are many files such as swap files, printer buffers, temp files, etc. that are not desirable to backup. Backing up these files can consume processing cycles, communication bandwidth, and backup memory capacity. *See* specification, ¶[0003].

Embodiments of the invention overcome some of these problems by providing systems and methods for backing up data and in particular to backing up those data blocks that are desired to be protected. This reduces the amount of data needed to make a backup, provides a more efficient user of the storage area, and also enables the frequency of backups to be increased if desired because the amount of data being backed up is reduced in comparison to conventional systems. *See* specification ¶[0008].

The primary reference of *Watanabe* teaches backing up data. As discussed at the Interview, however, the backup process taught by *Watanabe* is a remote copy process or a

migratory copy process. A migratory process, as taught by *Watanabe*, migrates data between two storage systems used as external memories. *See* col. 4, lines 42-44. For example, *Watanabe* may designate a partial volume for backup, but the partial volume has a specific address range and all data in that address range is backed up. *See* col. 19, lines 33-38. Further, *Watanabe* suggests that the data being backed up is offline during the migratory copy process and cannot be accessed. *See e.g.*, col. 19, lines 10-12; Figure 8 (element 703).

When considering claim 24 as a whole, one of skill in the art would not combine *Watanabe* and *Ohran* because of the fact that *Watanabe* teaches that the data being copied of should be offline, while claim 24 requires backing up the first data blocks to the snapshot copy without interrupting access to the mass storage device. Taking data offline as taught by *Watanabe* teaches away from the requirements of claim 24.

Further, *Watanabe* also fails to teach or suggest marking second data blocks as unprotected so as to be excluded from the backup as required by claim 24. As mentioned previously, *Watanabe* may designate a partial volume for backup, but the partial volume has a specific address range and all data in that address range is backed up. *See* col. 19, lines 33-38. This is consistent with *Watanabe*'s goal of offline migratory copying. *Watanabe* therefore makes no distinction between data blocks that have changed in that address range and has no teaching related to marking any of the data blocks in that data range as being desirable or undesirable for backup. The goal of *Watanabe* is to perform a migratory copy for all of the data in the designated address range.

For at least these reasons, the combination of *Watanabe* and *Ohran* fails to teach or suggest the invention as claimed in claim 24.

Claim 53 has been similarly amended to require "marking first data blocks to include in a snapshot copy of a mass storage device using a protection map and marking second data blocks to exclude from the snapshot copy of the mass storage device, using the protection map". Support for this amendment can be found, by way of example, in Figures 3 and 4, and in the specification at ¶¶[0067]-[0072]. For example, Figure 3 of the present application illustrates a protection map 53 in addition to a snapshot map and a backup map. As noted in the specification, the protection map 53 can be used to mark data blocks as being either desirable or undesirable for backup. *See* ¶[0067]-[0068]. Claim 53 requires including first data blocks in the snapshot copy while excluding second data blocks from the snapshot copy.

In contrast, this requirement is not taught or suggested by *Ohran*. For example, Figure 3 of *Ohran* only illustrates a snapshot map 52 and a backup map 48. A protection map that enables data blocks to be included or excluded from a snapshot is not depicted. For instance, *Ohran* teaches that the snapshot map 52 is used to identify which blocks have been preserved and may be overwritten. For example, *Ohran* states that "one preferred embodiment preserves a static snapshot by copying a data block that is to be overwritten from mass storage device 20 into snapshot storage 22 and then indicating that the block has been preserved in snapshot map 52 [T]he copy of the data block on the mass storage device 20 can [then] be overwritten." *See* col. 14, lines 1-7. The backup map 48 may "comprise a Boolean entry for each storage location on the mass storage device 20." *See* col. 13, lines 22-24. When a storage location has new data written in it, the entry for the storage location may then be set. *See* col. 13, lines 24-26.

Thus, the snapshot map 52 and the backup map 48 taught by *Ohran* fail to teach or suggest the requirement in claim 53 of "marking first data blocks to include in a snapshot copy of a mass storage device using a protection map and marking second data blocks to exclude from the snapshot copy of the mass storage device, using the protection map".

As discussed above, *Watanabe* also fails to teach or suggest marking fist data blocks as required by claim 53. *Watanabe* does not teach, as discussed above, "initiating an update of the snapshot copy . . . without interrupting access to the mass storage device."

For at least these reasons, the combination of *Watanabe* and *Ohran* fails to teach or suggest all of the limitations of claim 53 as set forth in claim 53. As a result, Applicants respectfully submit that claim 53 overcomes the art of record and is in condition for allowance.

The independent claims 35, 41, and 46 have been similarly amended and also overcome the cited art for at least the same reasons discussed herein.

As discussed at the interview and memorialized in the Interview Summary and for the reasons discussed herein, the amendments submitted herewith should overcome the prior art of record and claims 24-53 are not taught or suggested by the prior art of record.

Conclusion

In view of the foregoing, Applicants believe the claims as amended are in allowable form. In the event that the Examiner finds remaining impediment to a prompt allowance of this

application that may be clarified through a telephone interview, or which may be overcome by an Examiner's Amendment, the Examiner is requested to contact the undersigned attorney.

Dated this 29th day of September 2006.

Respectfully submitted,

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